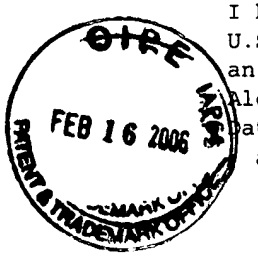


I hereby certify that this correspondence is being deposited with the U.S. Postal Service on the date set forth below as First Class Mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date of Signature and Deposit: Feb. 10, 2006

Attorney of Record

PATENT

Docket No. 920976.00005

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Hsu
Appl. No.:	10/668,586
Filed:	Sep. 23, 2003
For:	METHOD AND RADIAL GAP MACHINE FOR HIGH STRENGTH UNDIFFUSED BRUSHLESS OPERATION
Art Unit:	2834
Examiner:	K. Tamai

Declaration of John S. Hsu

Under 37 C.F.R. 1.132

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Dr. John S. Hsu, declare and state as follows:

1. I am the sole inventor is this patent application.

2. I have been granted at least 24 U.S. Patents and at least one UK patent as appears on my curriculum vitae attached hereto. I have also been a frequent contributor to IEEE publications and conferences in the field of motors

and motor control as appears in more detail in my curriculum vitae attached hereto as Exhibit 1.

3. I have reviewed the Office action of November 30, 2005, in which claims 1, 2, 5, 9, 11-15, 17, 18 and 19 were rejected as being anticipated by Rosenberg (US 3,411,027)), or obvious over Rosenberg in view of Koharagi (US 2002004734).

4. I understand that the U.S. Patent and Trademark Office has rejected my patent application because it was said that my claimed invention was shown completely by Rosenberg or that it would be obvious to modify Rosenberg according to the teaching of Koharagi.

5. The Examiner said that it is inherent that the permanent magnets 54 in Rosenberg contain excitation flux entering the pole pieces and inhibit flux leakage from the pole portions 49 and 51 (in Figs. 5 and 6). In his last action, the Examiner further said that the statements of my attorney filed 10/11/2005 have been considered but are not persuasive because in Rosenberg the magnetic flux from the permanent magnet will inherently flow from the south to the north poles and back to the south pole.

6. The Examiner's statements do not show an understanding of the difference between Rosenberg reference and my claimed invention for the following reasons:

a. Rosenberg teaches the weakening or enhancing of flux through a "shunt path" which includes a path through the permanent magnets (hereafeter "PMs") (See the arrows in Rosenberg, Figs. 1, 2a and 5 and description at col. 2, lines 38-43 defining the shunt path and col. 6, lines 8-10 relative to Fig. 5);

b. In contrast thereto, my claimed invention provides for enhancing of flux in a flux path through

poles of magnetic material to be distinguished from the PMs;

c. In contrast to Rosenberg, in my claimed invention, the PMs act to block or inhibit leakage of flux through the PMs in a flux enhancement mode - Rosenberg does not disclose or teach this;

d. To accomplish this, I have arranged the PMs not only between the poles but also between rotor pole portions of one polarity and the core portion of the rotor for containing the component of flux in the rotor pole portions as the component of flux is conveyed to the radial air gap and for inhibiting the component of flux from leaking from said pole portions prior to reaching the radial air gap when said direct current is of the first polarity. This is disclosed as element 38 disposed in slot 32b in the Figs. 5 and 5a shown below and described at para. 0034.

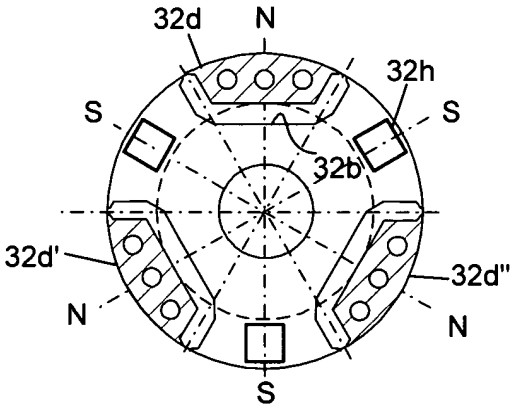


Fig. 5

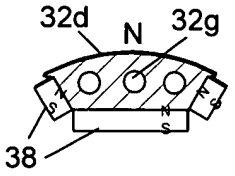
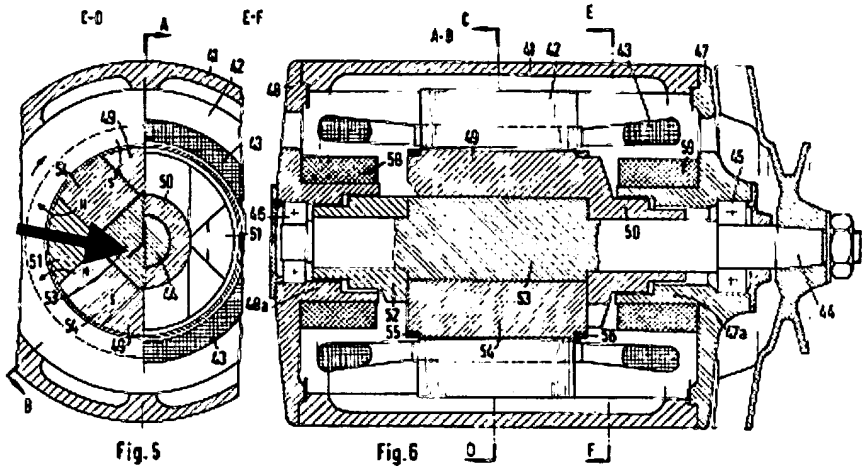


Fig. 5a

Figs. 5 and 5a, Hsu, U.S. Appl. No. 10/668,586

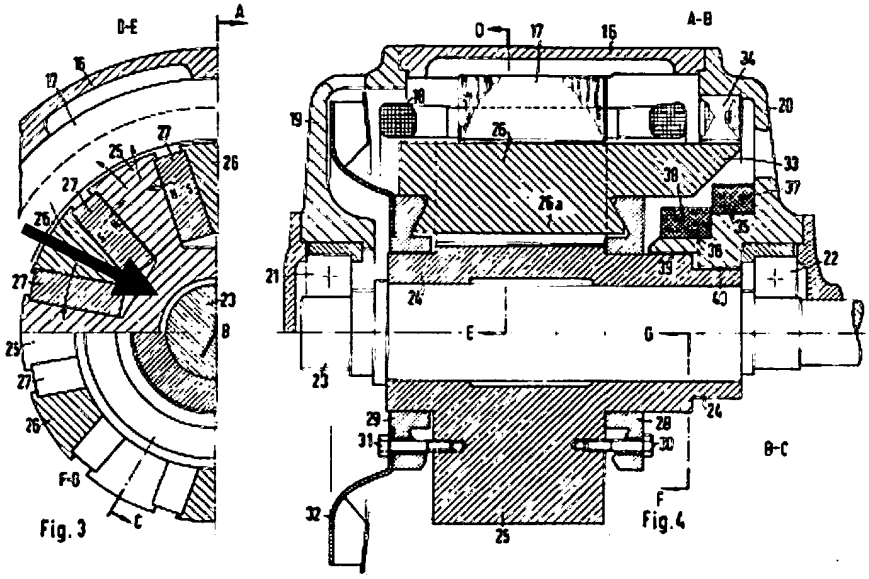
e. In Figs. 5 and 6 of Rosenberg there is an enlarged cross section 53 of the shaft of non-magnetic material underneath the poles. This is a reason that flux does not leak radially between magnets 54 on the path of the heavy black arrow, but it does not provide the structure or

function of my invention as expressed in claims 1 and 13.



Figs. 5 & 6, Rosenberg, U.S. Pat. No. 3,411,027

f. In Fig. 3 and 4 of Rosenberg, seen below, flux is shown as traveling through the PM material from poles 26 to poles 25. Flux would also leak from pole 26 between magnets 27 along a radial path as shown by the heavy black arrow.



Figs. 3 & 4, Rosenberg, U.S. Pat. No. 3,411,027

7. I next address the Examiner's rejection based on Rosenberg combined with Koharagi. In Koharagi, the PMs in

Fig. 4 and 6 are used to separate the poles but their stated purpose is to reduce "q-axis" reactance when the rotor is driven by a sensorless (no position or speed feedback) vector controller. A vector controller is an AC type of control, which in software resolves AC voltage and current into q-axis, d-axis and many other quantities in the controller, but nevertheless directly controls magnitude and frequency of AC quantities and does not directly control DC inputs on a motor. There are no DC coils supplying additional DC flux to add to the AC flux in the motor in Koharagi.

8. Neither Koharagi nor Rosenberg disclose the objective of preventing leakage of DC flux in a PM machine having additional DC excitation. There would be no suggestion to one of ordinary skill in the motor art to achieve the purpose of my invention by consulting these two references and no suggestion for combining their structures to provide the combination of my claimed invention.

9. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: February 6, 2006 John S. Hsu

John S. Hsu, Ph.D.

CURRICULUM VITAE

JOHN S. HSU (f/k/a HTSUI)

CITIZENSHIP: United States

EDUCATION:

Ph.D., Bristol University, England, 1969, Electrical Engineering
B.Sc., Tsing Hua University, China, 1959, Electrical Engineering

POST-DOCTORAL TRAINING:

Bradford University, England, 1969-1971, Power Electronics

PROFESSIONAL EXPERIENCE:

2001-	Distinguished engineer, Digital & Power Electronics, Oak Ridge National Laboratory
1993-2001	Senior staff scientist, Digital & Power Electronics, Oak Ridge National Laboratory
1990-1993	Manager and Researcher, Industrial Drives Program, Center for Electromechanics, The University of Texas at Austin
1986-90	Head, Rotating Machines and Power Electronics Program, Center for Energy Studies, The University of Texas at Austin
1986	Research Engineer, Center for Energy Studies The University of Texas at Austin
1975-86	Senior Research Engineer, Westinghouse Electric Corporation, Heavy Industrial Motors Division and Large Motors Division
1971-75	Engineering Specialist, Emerson Electric Company
1969-71	Post-Doctoral Fellow, Bradford University, England
1968-69	Designer, Newman Industries, England
1964-69	Ph.D. Research Worker, Bristol University, England
1962-64	Electrical Engineer, China Cold Storage & Engineering,

Hong Kong

1959-61 Lecturer, Tien-Tsin Technology University, China

INDUSTRIAL CONTRIBUTIONS:

30 years of industry experience in research, development, design, and production.
Technical innovations for the latest "Westinghouse World Series" heavy industrial induction motors.
ANSI C50.41 (Induction motor section)
Heavy power electronic circuit analytical methods.
Computer programs of synchronous and induction motor designs, transient torque calculations, brushless exciters, design optimizations, and etc currently used by industry.
Patents in power electronics, adjustable speed drives and motors.

AWARDS:
Westinghouse Engineering Award, 1983
Oak Ridge National Laboratory Extramile Award, 1997
Lockheed Martin Energy Research Corporation Certificate of Recognition, 1997

PROFESSIONAL COMMITTEE:

Member of IEEE/PES Induction Machinery Subcommittee, DC Machines Subcommittee.
Member of IEEE/IAS Electric Machines Subcommittee.

PROFESSIONAL REGISTRATION:

Registered Professional Engineer in Texas, Missouri, and New York

MEMBERSHIPS IN PROFESSIONAL ORGANIZATIONS:

Fellow, Institution of Electrical Engineers.
Senior Member, Institute of Electrical and Electronics Engineers, Inc.

CONSULTING EXPERIENCE: Westinghouse Electric,
Emerson Electric
ECO Waste Technology

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"Hybrid-Secondary Uncluttered Permanent Magnet Machine and Method," US Patent 6,977,454, December 20, 2005.

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"Soft-Commutated Direct Current Motor, U.S. Patent No. 5,929,579, July 27, 1999.

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"Motor and Control System Having Cyclic Reversal and Undirectional Capabilities," US Patent No. 3,969,658, 1976.

"Dynamoelectric Control System and Motor Therefor," US Patent No. 3,858,098, 1974.

"An Automatic Synchronizer and Phase Regulator for an Alternator with Two-Axis Excitation," UK Patent No. 1,152,263, 1967.

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John S. Hsu (Htsui), Pedro J. Otaduy, John D. Kueck, "Efficiency and Reliability Assessments of Retrofitted High-Efficiency Motors," Paper presented in the DOE's Tool and Protocol Workshop of Motor Challenge Program, Sept. 22-23, 1994, Chicago, Illinois.

John S. Hsu (Htsui), "Field Motor Efficiency Measurement Technique" Presented in the DOE's Tool and Protocol Workshop of Motor Challenge Program, Sept. 22-23, 1994, Chicago, Illinois.

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